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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/476,092	01/03/2000	DAVID F. SORRELLS	1744.0250001	7304

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EXAMINER

MEHRPOUR, NAGHMEH

ART UNIT PAPER NUMBER

2686

DATE MAILED: 01/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/476,092	Applicant(s) SORRELLS ET AL.	
	Examiner Naghmeh Mehrpour	Art Unit 2686	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22, 26-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12-18, 26-28 is/are allowed.
- 6) ☒ Claim(s) 1-11 and 19-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/22/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed reference listed in the information disclosure submitted on 11/22/05, have been considered by the examiner (see attached PTO-1449).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 1-11, 19-27**, are rejected under 35 U.S.C. 102(e) as being anticipated by Sorrells et al. (US Publication Number 2003/0068990).

Regarding **Claim 1**, Sorrells teaches method for down-converting a frequency modulated (FM) signal, comprising:

- (1) aliasing the FM signal at an aliasing rate, said aliasing rate being determined by the frequency of the FM signal (631);
- (2) adjusting said aliasing rate to compensate for frequency changes of the FM signal (634); and

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(3) outputting, responsive to steps (1) and (2), a demodulated baseband information signal (631);

wherein the aliasing rate is based upon the demodulated baseband information signal (639).

Regarding **Claim 2**, Sorrells teaches method wherein step (1), comprising:

Aliasing the FM signal at an aliasing rate that is substantially equal to a sub-harmonic of a frequency of the FM signal (642).

Regarding **Claim 3**, Sorrells teaches a method wherein step (1) comprises:

Aliasing the FM at an aliasing rate that is substantially equal to a frequency (643, 644).

Regarding **Claim 4**, Sorrells teaches a method further comprising the step of compensating for phase delays to maintain bandwidth and stability 724, 725).

Regarding **Claim 5**, Sorrells teaches a method wherein the FM signal has a frequency substantially equal to a family radio frequency (643- 644)

Regarding **Claims 6, 19**, Sorrells teaches a method for directly down converting 25 frequency modulated (FM) signal having a carrier frequency, comprising the steps of:

(1) aliasing the FM signal with a first local oscillator 23 (LO) signal to create a first down-converted signal, said first LO 23 signal having a first LO frequency and a first LO phase (616);

(2) aliasing the FM signal with a second signal to create a second down-converted signal, said second LO frequency and a second wherein said second LO frequency is substantially the same as said first LO frequency, and wherein said second LO phase is shifted relative to said first LO phase (161);

(3) combining said first down-converted signal and said second down--converted signal to create a summation signal (see figure 34);

(4) integrating said signal to create a control signal (616)

(5) generating the first 23 and the second LO 27 signals based on the control signal (616); and

(6) outputting, a demodulated baseband information signal (616).

Regarding **Claims 7-8**, Sorrells teaches a method wherein said second LO phase is shifted relative to said first LO phase by an amount that is substantially equal to one-half period and one quarter period of the FM signal and any multiple of a period of the FM signal (401, 404).

Regarding **Claim 9**, Sorrells teaches a method wherein step (5) comprises:

(a) compensating for phase delays to maintain stability by adjusting said control signal to create a compensated control signal (531); and

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(b) creating said **first and second LO signals** using said compensated control signal (531).

Regarding **Claims 10-11**, Sorrells teaches a method wherein the first and second LO signals are substantially equal to a sub-harmonic of the carrier of the FM signal (324). .

Regarding **Claim 20**, Sorrells teaches a method wherein step (3) comprising:

(a) summing the first and second down-converted signals to generate a summation signal (621)l; and

(b) integrating the summation signal to generate the control signal wherein the first and second LO signals are generated from the control signal (618, 634).

Regarding **Claim 21**, Sorrells teaches a method wherein step (4) comprises the step of: adjusting said control signal to maintain said mixer signal at a value substantially equal to zero (638).

Regarding **Claim 22**, Sorrells teaches a method wherein comprises:

Maintaining the first second LO signals such that one of the first and second LO signals leads the FM signal, another of the first and second LO signals lags the FM signal (596, 597)

Allowable Subject Matter

4. **Claims 12-18, 26-28**, are allowed.

5. The followings a statement of reasons for the indication of allowable subject matter:

Regarding claim 12, the present application teaches a first aliasing module and second aliasing module to alias the FM signal and a summing module to combine the first signals and the second signal to create a summation signal as specifically mentioned in claim 12.

Regarding claim 26, the present application teaches a down converter comprising: a first aliasing module; and a second aliasing module; and a summer coupled to the first and second aliasing modules as mentioned in claim 26.

The closest record of prior art Sorrells teaches an FM receiver comprising a local provides a radio receiver for receiving a selected FM signal in which a message signal $A(t)$ modulates the frequency of carrier signal, comprising a local oscillator for producing a local oscillator signal, a heterodyning stage for heterodyning said selected FM signal with said local oscillator signal so as to reduce the frequency which is modulated by said message signal to an intermediate frequency, and a demodulator stage for accepting an output signal from said heterodyning stage and extracting said message signal therefrom, characterized in that said heterodyning stage comprises signal producing means for producing n signals $a_{sub.1} \dots a_{sub.n}$ wherein each signal consists of said message signal modulated at said intermediate frequency, said signals $a_{sub.1} \dots a_{sub.n}$ being related by the expression. Sorrells fails to teach a first aliasing

module and second aliasing module to alias the FM signal and a summing module to combine the first signals and the second signal to create a tracking module changes in frequency of the FM signal; an LO signal changing module to change the first and second LO signals based on the changes in frequency.

Response to Arguments

6. Applicant's arguments with respect to claims 1-11, 19-22, have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. **Any responses to this action should be mailed to:**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Naghmeh Mehrpour whose telephone number is 571-272-7913. The examiner can normally be reached on 8:00- 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold be reached (571) 272-7905.

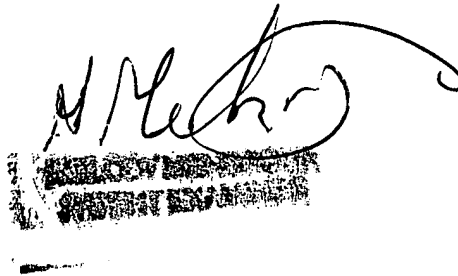
The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NM

January 24, 2006

A handwritten signature in black ink, appearing to read "J. M. Cho", is written over a rectangular, dark, textured stamp. The stamp is located in the lower right quadrant of the page.